

1 tgggacaggcagctccggggtccgcggtttcacatcggaaacaaaacagcggctggcttg 60
 -----+-----+-----+-----+-----+
 accctgtccgtcagaggccccaggcgccaaagtgtagcctttgttttgcgcccagccagac
 G Q A A P G S A V S H R K Q N S G W S G -

 61 gaaggaaactgagctacgagccgcggcggcagcggggcgggcgggaagcgtataccata 120
 -----+-----+-----+-----+-----+
 ctcccttggactcga tgc tggcgccgcgctcgccccgccccccttcgcata tggatta
 R N L S Y E P R R Q R G G G E A Y T * S -

 121 ctgggagccctgcaagtgaacacagcctttgcggtcccttagacagccttggcctggaggaga 180
 -----+-----+-----+-----+-----+
 gacctcgggacgtttac tgttgcggaaacgccaggaatctgtcgaaccggacc tcc tct
 G S L Q V T T A F A V L R Q L G L E E N -

 181 acacatgaagaagaacacctcaagaggctttgttttctgtgaacagtat tttc tatacag 240
 -----+-----+-----+-----+-----+
 tgtgtactttctttcttggagttctccgaaacaaagacac tttgtcataaagata tgtc
 T * K K E P Q E A L F S V K Q Y F Y T V -

 241 ttgctccaa tgacagaggttacctgcaccgttgctctacttccagaatgcacagatgtcttg 300
 -----+-----+-----+-----+-----+
 aacgaggtttac tgtc tcaatggacgtggcaacaggatgaagggttacctgtcttacagac
 A P M T E L P A P L S Y F Q N A Q M S E -

 301 aggcacaaccacc tgagcaatac tgtacgtagccagaatgacaatagagaacggcaggagc 360
 -----+-----+-----+-----+-----+
 tcc tgttggtagactcgttatgacatgcatcgggtcttactgttatctcttggcgtcc tgc
 D N H L S N T V R S Q N D N R E R Q E H -

 361 acaacgacagacggagccttggccaccctgagccattatctaa tggacgaccccaagggtta 420
 -----+-----+-----+-----+-----+
 tgttgc tgtc tgcctcggaaacgggtgggactcggtaatagattacctgtctgggtcccat
 N D R R S L G H P E P L S N G R P Q G N -

 421 ac tccggcaggtgggtggagcaagatgaggaaagaatgaggagctgacattgaaata tgg 480
 -----+-----+-----+-----+-----+
 tggggccggtccaccacctcgttctactccttcttctactcctcgactgttaactttat ac
 S R Q V V E Q D E E E D E E L T L K Y G -

 481 gcgccaaagcatgtgatac tgc tctttgtccctgtgactc tctgcatagggtgggtcgtgg 540
 -----+-----+-----+-----+-----+
 cgcgggttcgtacac tagtacgagaacagggaacac tgagagacgtaccaccaccagcacc
 A K H V I M L F V P V T L C M V V V V A -

FIG.1A

1081 gaaatgaaacgctttttccagctctcatttactcctcaacaatgggtggtggtgaa ta 1140
 -----+-----+-----+-----+-----+
 ctttacttttgcgaaaaaggctcgagagtaaatgaggagttgttaccacaccaaccacttat
 N E T L F P A L I Y S S T M V W L V N M -

 1141 tggcagaaggagacccggaagctcaaaggagagta tcacaaaaatccaagtataatgcag 1200
 -----+-----+-----+-----+-----+
 accgtcttccctcgggcccgcgagtttccctcctatagggtttttaaggttcatattacgtc
 A E G D P E A Q R R V S K N S K Y N A E -

 1201 aaagcacagaaagggagtcacaaagacac tgttgcagagaaatgatagtggcgggttcagtg 1260
 -----+-----+-----+-----+-----+
 tttcgtgtctttccctcagtggttcgtgacaacgtctcttactactaccgcccaagtcac
 S T E R E S Q D T V A E N D D G G F S E -

 1261 aggaatgggaagcccgagaggagcagtcata tggggccctcatcgctctacaccagtcac 1320
 -----+-----+-----+-----+-----+
 tctttacccttcgggtctccctgtcagtagatcccgagtagcgagagtgtggactcagtg
 E W E A Q R D S H L G P H R S T P E S R -

 1321 gaggctgctgtccaggaaactttccagcagta tccctcgctgggtgaagaccagaggaagg 1380
 -----+-----+-----+-----+-----+
 ctcgacgacaggtccttgaagggtcgctcataggagcgaccactctcgggtctcctttccc
 A A V Q E L S S S I L A G E D P E E R G -

 1381 gagtaaaacttggattgggagatttcatatttctacagtgttctgggttggtaaagccctcag 1440
 -----+-----+-----+-----+-----+
 ctcatatttgaacctaacctcttaangtaaaagatgtcacaagaccaaccatttcggagtc
 V K L G L G D F I F Y S V L V G K A S A -

 1441 caacagccagtggaagctgggaacacaacca tagcctgtttcgtagccataattaattggtt 1500
 -----+-----+-----+-----+-----+
 gttgtcggtcaccctctgaccttgggttgggtatcggacaagcatcggtataatataaccaa
 T A S G D W N T T I A C F V A I L I G L -

 1501 tgtgccttacattattactccttgccattttcaagaaagcattgccagctcttccaa tct 1560
 -----+-----+-----+-----+-----+
 acacggaatgtataatgaggaacggtaaaagttctttcgtaacggctcgagaagggttaga
 C L T L L L L A I F K K A L P A L P I S -

 1561 ccatcacctttgggctgtgttttctactttgccacagattatcttgtacagccctttatgg 1620
 -----+-----+-----+-----+-----+
 ggtagtggaaacccgaacaaaagatgaaacgggtgtctaatagaacatgtcggaataacc
 I T F G L V F Y F A T D Y L V Q P F M D -

FIG.1C

1621 accaattagcattccatcaaattttatattctagcatatttgcggttagaaatcccatggatg
 -----+-----+-----+-----+-----+-----+-----+-----+
 tggttaatcgtaaggtagttaaaatagatcgtaaaacgccaatcttagggtagctac
 Q L A F H Q F Y I * H I C G * N P M D V -
 1680
 1681 tttctctttgactataaaccaaatctggggaggacaaaggtagattttcctgtgtccacat
 -----+-----+-----+-----+-----+-----+-----+-----+
 aaagaagaacatgaatttgggttagacccctcctgtttccactaaaaggacacaggtgta
 S S L T I T K S G E D K G D F P V S T S -
 1740
 1741 ctaacaagaatcaagaatcccggtcggacttttgacgttctcttccaagtcttcttgacca
 -----+-----+-----+-----+-----+-----+-----+-----+
 gatgtttcagttcttaaggccgacctgaaaacgtgaaaggaaaggttcagaaggacgtgt
 N K V K I P G W T F A A S F Q V F L T T -
 1800
 1801 ccttgactatttggactttggaaggagggtgccatagaaaacgaatttgaaacatacttca
 -----+-----+-----+-----+-----+-----+-----+-----+
 ggaacgtgataacctgaacattctctccacggatatacttttgcataaaccttgtagaagt
 L H Y W T L E G G A Y R K R F * T Y F I -
 1860
 1861 tcgcagttggactgtgtccctcgggtgcagaacatccagatttgaggagcagggtcaaggga
 -----+-----+-----+-----+-----+-----+-----+-----+
 agcgtcacctgacacagggaagccacgtctttgatgggtcaaacctccctgtctcagttcct
 A V D C V P R C R N Y Q I * G T R S R R -
 1920
 1921 gatattgataggcccggaagtgtgtgtgcccatcagcagcttgacgcgtggtcacaggac
 -----+-----+-----+-----+-----+-----+-----+-----+
 ctatactatccgggctttcaacgacacggggtagtcgtcgaactgcgcaccagtgctcctg
 Y D R P G S C C A P S A A * R V V T G R -
 1980
 1981 gatttactgacactgcgaactctcaggactaccggttaccagaagggttaggtgaagtgg
 -----+-----+-----+-----+-----+-----+-----+-----+
 ctaaaagtacgtgtgacgtctgagagtcctgatggccaatgggttccaatccacttcacc
 F H * H C E L S G L P V T K R L G E V V -
 2040
 2041 tttaaaccaaacggaactcttcatcttaaacatacagttgaaaaatcaaccaataattctt
 -----+-----+-----+-----+-----+-----+-----+-----+
 aaatttgggttgccttgagaagtgaatttgatgtgcaacttttaggttgggttattatga
 * T K R N S S S * T T R * K S T Q * F C -
 2100
 2101 gtattaaactgaattctgaacttttcaggagggtactgtgagggaagcagggcaccagcagc
 -----+-----+-----+-----+-----+-----+-----+-----+
 cataaatgacttaagacttgaaaagtcctccatgacactccttctcgtcctggtgctcgtg
 I N * I L N F S G G T V R K S R H Q Q Q -
 2160

FIG.1D

2161 agaatgggggaatgggaagggtgggcaggggttcagcttccctttgatttttgcgtgcaga 2220
 tcttacccttaccctctccaccgtccccaagggtcgaagggaactaaaaaacgacgtct
 N G E W R G G Q G F Q L P F D F L L Q T -

2221 ctcatactttttaaatgagacttgttttccctctctttgagtcagtcataatgtaga 2280
 gagtagggaataatttactctgaacaaaaggggagagaactcagttcagtttaacatct
 H P F * M R L V F P S L * V K S N M * I -

2281 ttgcctttggcaattcttcttctcaagcactgacactcattaccgtctgtgattgccatt 2340
 aacggaaaccgtttaagaagaagattcgtgactgtgagtaatggcagacactaacggtaa
 A F G N S S S Q A L T L I T V C D C H F -

2341 tcttcccaaggccagcttgaaactgagggttgctttaacctaaagttttaacctcaggtt 2400
 agaagggttccggtcagacttggactccaacgaatatggaattttcaaaattggagtccaa
 F P R P V * T * G C F I L K V L T S G S -

2401 ccaaatcagtaaaatttggaaacagtagcgtatttctcatcaattctctatcatgttg 2460
 ggtttaagtcatttaaaacctttgtcatgtcgaataagagtagttaagagatagtacaac
 K F S K F W K Q Y S Y F S S I L Y H V E -

2461 aagtcaaatttggattttccaccaaatctgaattttagacatacttgtacgtctactt 2520
 ttacgttttaaacctaaaagggtgggtttaagacttaaacatctgtatgaacatgcgagtgaa
 V K F G F S T K F * I C R H T C T L T C -

2521 gccccagatgctctctctgtctcattctctctccacacaagcagctttttctac⁷a 2580
 cgggggtctcaggaggagacaggagtaagaagagagggtgtgttcgtcagaaaaagatgt
 P Q M P P L S S F F S P T Q A V F F Y S -

2581 gccagtaaggcagctctgctctggtagcagatgggccattattctagggtcttactctt 2640
 cgggtcattcgtcgagacagacacatcgtctaccagggttaataagatcccagaatgagaa
 Q * G S S V ? V A D G P I I L G S Y S L -

2641 tgtatgatgaagaagaatgtgttatgaatcgggtgctgtcagccctgctgtcagaccttctt 2700
 acatactacttttcttacacaaatcttagccacgacagctcgggacgacagctctggaagaa
 Y D E K N V L * I G A V S P A V R P S S -

FIG.1E

ccacagcaaatgagatgatatgccccaaagcggtagaattaaagaagagtaaaatggctgtt
 2701 -----+-----+-----+-----+-----+ 2760
 gggtgcgtttactctacatacgggtttcgcacatcttaatttcttctatittaccgacaa
 T A N E M Y A Q S G R I K E E * N G C * -
 2761 gaagc
 ----- 2765
 cttcg
 S -

FIG.1F

ctaccattaa⁺g⁺tcagtcagc⁺ttttat⁺tacccgga⁺agga⁺tgggcagc⁺taact⁺ataccccat
 541 ----- 600
 gatgggtaattcagtcagtcgaaaa⁺at⁺gggcct⁺tcc⁺taccg⁺tcgatt⁺agata⁺tggggta
 T I K S V S F Y T R K D G Q L I Y T P F -
 tcacagaagataccgagac⁺tgtgggcca⁺gagag⁺cctgcact⁺caatt⁺ctgaa⁺tgtgtcca
 601 ----- 660
 agtgtcttctatggctctgacacccgg⁺tctctc⁺gggac⁺gtgag⁺ttaagact⁺tacgacgg⁺t
 T E D T E T V G Q R A L H S I L N A A I -
 tcatgatcagtg⁺tcat⁺tgtt⁺gtcat⁺gac⁺tatcc⁺tctg⁺gtg⁺ttct⁺gtata⁺aat⁺acaggt
 661 ----- 720
 agtactagtcacagta⁺acaacag⁺tact⁺gata⁺gggagg⁺accacca⁺agacat⁺tttat⁺gtgtcca
 M I S V I V V M T I L L V V L Y K Y R C -
 gctataagg⁺tcat⁺ccat⁺gcct⁺ggct⁺tatt⁺tata⁺tcat⁺ctct⁺tatt⁺gtgt⁺gtgt⁺ttttttt
 721 ----- 780
 cgata⁺ttccag⁺taggt⁺acgg⁺accgaa⁺taata⁺tag⁺tagaga⁺taaca⁺acgaca⁺agaaaaaa
 Y K V I H A W L I I S S L L L L F F F S -
 cattcatttacttggggga⁺agt⁺gttt⁺aaaac⁺ctata⁺acgt⁺tgt⁺gtg⁺gact⁺acatt⁺ac⁺tg
 781 ----- 840
 gtaagtaaa⁺tgaaccc⁺cttca⁺caaat⁺tttgg⁺atatt⁺gca⁺acgac⁺acct⁺gtat⁺gta⁺gtac
 F I Y L G E V F K T Y N V A V D Y I T V -
 ttgcactcctga⁺tctgga⁺attt⁺gg⁺tgtg⁺tgga⁺atga⁺tttcc⁺att⁺cact⁺tgga⁺aaagg⁺tc
 841 ----- 900
 aacgtgaggac⁺tagac⁺cttaaa⁺accacac⁺ccct⁺tact⁺aaagg⁺taagt⁺gac⁺ctttccag
 A L L I W N F G V V F M I S I H W K G P -
 cacttcga⁺ctccag⁺cagg⁺cata⁺tctcat⁺tatga⁺ttag⁺tgtccc⁺tcat⁺tggtccc⁺tgg⁺gtgt⁺ta
 901 ----- 960
 gtgaag⁺ctgagg⁺tcgtcc⁺gtatag⁺agta⁺tact⁺aa⁺tcacggg⁺ag⁺taccggg⁺accacaa⁺at
 L R L Q Q A Y L I M I S A L M A L V F I -
 tcaagtacc⁺tccc⁺tgaat⁺ggac⁺tgc⁺tggc⁺tcat⁺tctgg⁺ctgt⁺gat⁺tccag⁺tata⁺tgatt
 961 ----- 1020
 agttcatgga⁺gggac⁺ttac⁺ctga⁺cgcac⁺cagag⁺taga⁺accga⁺cact⁺aaag⁺tcata⁺tactaa
 K Y L P E W T A W L I L A V I S V Y D L -
 tagtggctgttttg⁺Cgt⁺ctgaa⁺agg⁺tccac⁺ttc⁺Ata⁺tgt⁺gtgt⁺gaa⁺acag⁺ctcagg⁺aga
 1021 ----- 1080
 atcacggacaaa⁺cacagg⁺cttt⁺ccagg⁺tga⁺gcata⁺cagacca⁺aa⁺cttt⁺gtcga⁺gtcc⁺tct
 V A V L R L K G P L H M L V E T A Q E R -

FIG.2B

1081 gaaatgaaacgctttttccagctctcatttactcctcaacaatgggtgtggttgggtgaaata 1140
 ctttacttttgcgaaaaagggtcgagagttaagtggaggttgtttaccacaccacacaccttat
 N E T L F P A L I Y S S T M V W L V N M -

1141 tggcagagaggagaccgggaagctcaaaaggagagtatccaaaaattccaagtataatgcag 1200
 accgtctttcctctgggacctcgagtttccctctcattaggtttttaagggtcatattacgtc
 A E G D P E A Q R R V S K N S K Y N A E -

1201 aaagcacagaaaggaggagtcacaagacacgtttgcagagaaatgaatgaagggttcagtg 1260
 tttcgtgtctttccctcagtggttctgtgacaacgtctcttac tacaccgccaagtcac
 S T E R E S Q D T V A E N D D G G F S E -

1261 aggaattgggaagcccagaggggacagtcattcagggtctatcgtctctacacctgagtcac 1320
 tccttacccttcgggtctccctgtcagtagatcccgagtagcgagatgtggactcagtg
 E W E A Q R D S H L G P H R S T P E S R -

1321 gagctgtgtccaggaaactttccagcagtatcctcgtcgggtgaagaccagaggaaggagg 1380
 ctcgacgacagggtccttgaagggtcgtcattaggagcgaccacttctgggtctcctttccc
 A A V Q E L S S S I L A G E D P E E R G -

1381 gagtaaaacttggattgggagatttcattttctacagtgttctgggtggtaaaacctcag 1440
 ctattttgaacctaacctctaaagttaaagatgtcacaagaccaaaccttttcggagtc
 V K L G L G D F I F Y S V L V G K A S A -

1441 caacagccagtgagagactggaacacacaacatagccgttttcgtagccatatataattgggt 1500
 gttgtcgggtcaccctctgacctgtgttgggtatcggaacaaagcatcgggtataatttaaccaa
 T A S G D W N T T I A C F V A I L I G L -

1501 tgtgcccttacattattactccttgccattttcaagaaagcattgccagctcttccaactct 1560
 acacggaaatgtataatgaggaacggtaaaaggtcttctcgtaacggtcgagaagggttaga
 C L T L L L L A I F K K A L P A L P I S -

1561 ccatcacctttgggctgttttctactttgccacagattatcttgtacagccttttatgg 1620
 ggtagtggaaacccgaaacaaagatgaacgggtgtctaatagaacatgtcggaaaaatcc
 I T F G L V F Y F A T D Y L V Q P F M D -

FIG.2C

1621 accaatagcatctccatcaattttatcttagcataattgcggttagaattcccatggatg
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1680
tgggttaaactgtaaggtagttaaaatatagatcgtaaaacgccaaactttagggtaccatc
Q L A F H Q F Y I * H I C G * N P M D V -
↓
1681 tttctctttgactataaccaaaactctggggaggacaagggtgattttccctgtgtccacat
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1740
aaagaagaanaactgataattgggtttagacccctctgtttccactaaaaggacacagggtgta
S S L T I T K S G E D K G D F P V S T S -
1741 ctaacaaagtcagaattcccggttggaacttttgcagcttcttccaagcttctctgacca
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1800
gattgtttcagttctaaagggccgacctgaaaacgtcgaaggaagggttcagaaggacgggt
N K V K I P G W T F A S F Q V F L T T -
1801 ccttgcactattggacttttggaggagggtgcctatagaaaacgattttgaacatacttca
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1860
ggaaactgtaaacctgaacacttctccacggaatacttttgcataaacctgtatgaagt
L H Y W T L E G G A Y R K R F * T Y F I -
1861 tcgcagtggaactgtgtccctcgggtgcgaacattaccagatttgaggacgagggtcaagga
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1920
agcgtcacctgacacagggagccacgtctttgatgggtctaaactcctctgctccagttcct
A V D C V P R C R N Y Q I * G T R S R R -
1921 gatatgataggcccggaagttgctgtgccccatcagcagcttgacgcgtgggtcacaggac
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1980
ctatactatctcgggcttcaacgacacggggtagtctgtcgaactgcgcaccaggtgtcttg
Y D R P G S C C A P S A A * R V V T G R -
1981 gatttcaactgacactgcgaactctcaggactaccggttaccgaagaggttaggtgaagtgg
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 2040
ctaaagtgaactgtgacgcttgagagtcctgatggccaatgggttctccaatccacttcacc
F H * H C E L S G L P V T K R L G E V V -
2041 tttaaaccaaaggaacttctatcttaaacatacagttgaaaataaccaataattct
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 2100
aaaatttggtttggccttgagaagtagaatttgatgtgcaacttttagttgggttattaaga
* T K R N S S S * T T R * K S T Q * F C -
2101 gtattaaactgaattctgaacttttcaggagggtactgtgaggaagagcaggccaccagcagc
-----+-----+-----+-----+-----+-----+-----+-----+-----+ 2160
cataattgactttaagacttgaanaagtcctccaagacactccttctcgctcgggtcgctcg
I N * I L N F S G G T V R K S R H Q Q Q -

FIG. 2D

2161 agaa tggggaa tggaga gg tgggcagggg ttcagct tccc tttgatttttgc tgcaga
 tcttacccttacc tctccaccg tccccaagg tgcgaagggaacctaaaaacgacgtct
 N G E W R G G Q G F Q L P F D F L L Q T -

2221 ctcatc ttttttaa tgagact tgttttcccc tctctt tgagtc aagtc aaata tgtaga
 gagtag gaaaaa tttact tgaacaaa aggggag agaaact cagttc agttta tacatct
 H P F * M R L V F P S L * V K S N M * I -

2281 ttgcc tttggcaattct tcttctca agcactg acactc attacc gtc tgtgattgccatt
 aacggaa accg ttaaga agaagat tctgtg actgtgtg ataatggc agacac taacggtaa
 A F G N S S S Q A L T L I T V C D C H F -

2341 tcttcca aggcagct tgaacc tgaagg ttgcttta tcc taaagitt aaacctc aggtt
 agaagg gttccggtc agacttgg actcca acgaaa taggattttc aaaa ttggagtc caa
 F P R P V * T * G C F I L K V L T S G S -

2401 ccaaattc agtaaa ttttggaa acagta cagctatt tctcat caattct tcatat gttg
 gg tttaa gtcatt taaa acc tttgtc atgtcga taagag tagtta agagat agtacaac
 K F S K F W K Q Y S Y F S S I L Y H V E -

2461 aagtc aaatttgg aatttccac caaattct gaattt gtagaca tactt gtagc tcaatt
 tt cagtttaaac ctaaa aggtgg ttaagac ttaacac atctgt atgaaca tgcgag tga
 V K F G F S T K F * I C R H T C T L T C -

2521 gccccc agatgcc tcc tctgtc tcat tcttct tcccac acaagc agtcttttct taca
 cggggg tctacgg agggaga caggag taaga agagaggg tgtgtt cgtcaga aaaaag atgt
 P Q M P P L S S F F S P T Q A V F F Y S -

2581 gccagta aggcagc tctgtc r tggtagc agatgg tccca tta ttc taggg tcttac tctt
 cgg tcat tccg tgcagac agyacca tctgtc taccagg gtaata aga tcccaga atga gaa
 Q * G S S V ? V A D G P I I L G S Y S L -

2641 tgtatga tga aaagaa tgtgtt atgaa tcgg tgc tgcagccc tgc tgcagac cttctt
 aca tac tac ttttct taca caatct ttagcc acgac agtcggg acgac agtc tggaa gaa
 Y D E K N V L * I G A V S P A V R P S S -

FIG.2E

2701 ccacagcaaatgagatgtatgccc aaagcggtagaattaaagaagagtaaaatggctgtt
 -----+-----+-----+-----+-----+ 2760
 gggtgcgtttactctacatacgggtttcgcacatcttaattcttcattttaccgacaa
 T A N E M Y A Q S G R I K E E * N G C * -
 gaagc
 2761 ----- 2765
 cttcg
 S -

FIG.2F